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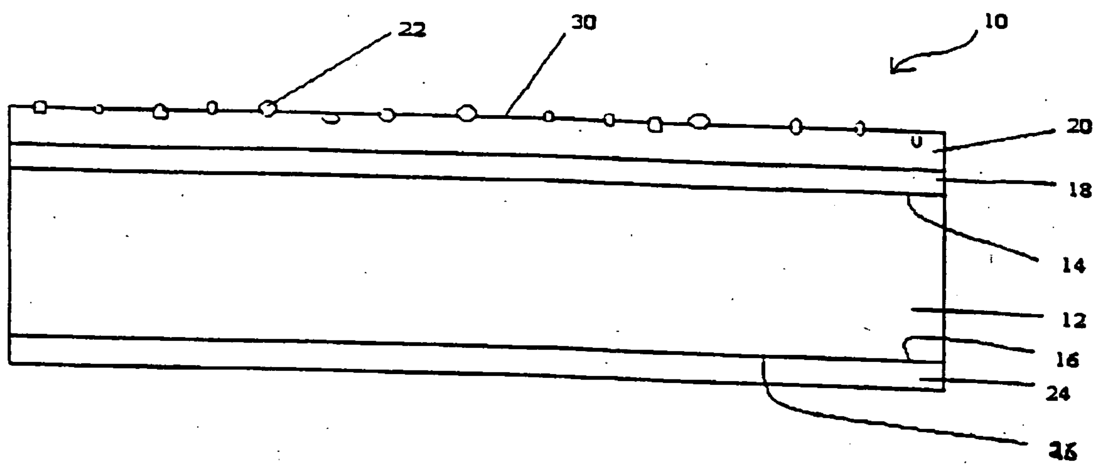
(54) **MATERIAU DE TOITURE A SURFACE GRANULEUSE**
(54) **ROOFING MATERIAL WITH GRANULAR SURFACE**



(57) A roofing membrane material is disclosed. The material is characterized in that it includes a rubberized asphalt layer and a polyethylene reinforcement layer having a polyurethane layer on its upper surface. The polyurethane layer includes embedded grit to provide a high friction surface offering good traction.

ROOFING MATERIAL WITH GRANULAR SURFACE

Field of the Invention

The present invention is in the field of roofing materials. More particularly, the present invention is in the field of roofing membrane materials having a granular surface to provide traction to roofing installers during construction of the roof.

Background of the Invention

Asphalt based roofing shingles are presently installed on approximately eighty percent of the homes in the United States. In areas where snow accumulates, roof shingles can develop leaks as a result of ice dams which can form along the eaves of a roof. Ice dams form as the result of a differential temperature which occurs between the eaves of the roof and the interior sections of the roof. The temperature differential occurs when heat rises into the attic space. Under certain temperature conditions, snow collected on the roof surface will melt along the upper interior portions of the roof and then freeze when the liquid snow-melt reaches the cooler eave section of the roof. As can be seen in FIG. 1, the result is that a pool 1 of liquid water can form between the roof surface 2 and the ice dam 3. The ice dam 3 prevents the water from reaching the gutter 4 and draining away. Ultimately, the liquid water 1 can leak 5 through the roof surface 2, causing interior water damage to the structure. Ice dams can also occur as a result of frozen slush accumulating in gutters, also causing liquid to collect and leak through the roof.

In a typical roofing installation using asphalt shingles, an underlayer is first applied to the plywood deck of the roof. The underlayer may take the form of an asphalt saturated paper which is useful as a waterproofing member. Roofing shingles are applied on top of the underlayer with the seams of adjacent rows positioned in an offset relationship. In practice, a starter row or strip is begun at the roof eaves using self-sealing shingles. The end of the first shingle in the strip is trimmed such that, when it is placed on the deck, the cutouts of the first course of shingles will not be placed over the starter strip joints. The starter strip and the shingles are nailed to the eaves. Successive rows of shingles are then secured to the deck or roof using.nails.

To ensure maximum protection against ice dams, membranes or metal flashing is installed wherever there is a possibility of icing, such as along the eaves of the roof. As noted above, ice dams are formed by the continual thawing and freezing of melting snow, or the backing up of frozen slush in gutters, which force water under the roofing, thereby causing damage to a structure's ceilings, walls, and insulation. The ice damming problem is most acute

on low-slope roofs; that is, roofs with a slope of two inches (5.08 cm) to four inches (10.16 cm) per foot (30.48 cm).

Traditional eaves flashing has either been 50-pound coated felt or two layers of 15-pound saturated felt cemented together. The term "pound" is defined as the weight of the felt required to cover an area of 108 square feet. Typically, the asphalt used in the fifty-pound felt is not modified with rubber, and after aging, will not form a good seal around nails. Additionally, the installation of two layers of 15-pound saturated felt consumes undesirable amounts of time and also will not seal around nails.

The use of self-adhesive products, such as ice and water protective membranes, has now become commonplace. A major problem with these products is that they are slippery, especially when wet or covered with frost. Slippery surfaces upon roofs create significant safety hazards for roofing installers, especially since such surfaces tend to be at least one story above ground level.

Summary of the Invention

The present invention relates to roofing membrane materials having a surface like sandpaper to provide traction to workers during construction of the roof. More particularly, the present invention relates to a roofing membrane material having a rubberized asphalt layer having an upper surface and a lower surface, a supporting layer disposed on the upper surface of the rubberized asphalt layer, and a traction layer disposed on the supporting layer.

For preventing multiple layers of the membrane from adhering to one another during shipping and storage, a release sheet can be applied to the lower surface of the rubberized asphalt layer. As a result of the release sheet, when the membrane is rolled, or when several layers of the membrane are stacked together, the release sheet is interposed between the sticky lower surface of the rubberized asphalt and the adjacent traction layer. By interposing the release sheet, adhesion between subsequent layers of the membrane material is prevented. Of course, prior to application to a roof surface, the release sheet is removed, thereby allowing the sticky underside of the membrane to adhere to the roof.

One object of the present invention is to provide rubberized asphalt roofing product which can be applied along the eaves of a roof to serve as a water infiltration barrier for the first course of overlying shingles.

Another object of the present invention is to provide a roofing membrane having a non-slip surface for the safety of roof installers.

These, and additional features and advantages of present invention, will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

Brief Description of the Drawings

FIG. 1 is a side elevational view of a portion of a roof showing an ice dam.

FIG. 2 is a sectional view of the roofing membrane of the present invention.

FIG. 3 is a perspective view of the eaves of a roof having the membrane of the present invention, and several shingles, applied thereto.

FIG. 4 is a side elevational view of the portion of the roof shown in FIG. 2, with the shingles removed for the purpose of clarity.

Detailed Description

The present invention relates to self-adhesive membranes which have been developed to eliminate problems associated with ice dams. The inventive membranes have a top surface or internal reinforcement which supports a sticky, rubberized asphalt bottom layer that adheres directly to the wood deck of a roof. Roof shingles may then be applied directly over the membrane. The membrane prevents water entry into the structure by adhering to the deck and sealing around the nails which are used to hold the shingles to the roof deck.

To date, two types of self-adhesive membranes have been developed to solve the ice dam problem: granular surfaced membranes and polyethylene surfaced membranes. The present invention relates to the polyethylene surfaced membranes and sets forth improvements thereto. Typical polyethylene surfaced products are either embossed or coated to reduce the slip hazard to the roofing installer. Since the roofer must stand on the membrane during its application to the roof deck, surface traction on the membrane is a significant safety issue. The present invention increases surface traction on the membrane in a novel way. Specifically, the polyethylene is coated with a urethane, and then grit is applied to the urethane prior to curing to form a material having a surface similar to sandpaper. Other coatings that adhere to polyethylene and will harden but remain flexible, include epoxy, polyester, varnishes, EVA and the like may also be

employed to cover the polyethylene and secure the grit. The coating may be UV or oven curable, or it may be hot melt.

In its broadest sense, the present invention comprises a roofing membrane material having a rubberized asphalt layer, a supporting layer and a traction layer. FIG. 2 depicts a roofing membrane material 10 of the present invention. More particularly, as can be seen in FIG. 2, the roofing membrane material 10 comprises a multilayered structure formed of a rubberized asphalt layer 12, having upper 14 and lower 16 surfaces, a supporting layer 18 disposed on the upper surface 14 of the asphalt layer 12, and a traction layer 20 disposed on the surface of the supporting layer 18 which is not in contact with the upper surface 14 of the asphalt layer 12. A traction material, such as a grit 22 or mineral particles is embedded in the surface of the traction layer 20 to provide a relatively non-slip surface. Optionally, a release sheet 24, such as a paper or plastic film having a siliconized surface 26 can be adhered to the lower surface 16 of the asphalt layer 12. The release sheet 24 is removed prior to use of the membrane material to allow the lower surface 16 of the asphalt layer 12 to be adhered to a roof surface.

The above-described structure addresses many of the needs currently embodied in the roofing industry. For example, the rubberized asphalt layer 12 provides a good seal between the membrane and the roof surface to prevent moisture from penetrating into the roof, even if ice dams are formed on the eaves of the roof. The rubberized asphalt layer 12, elongates and recovers around the nails, thereby providing an excellent seal around nails that pass through the material to secure shingles to the roof surface. The supporting layer 18 serves to maintain the structure of the material. Finally, the traction layer 20 serves to provide a non-slip surface to the portion of the membrane material 10 that will be stepped on by roof installers. This non-slip surface offers the roofing installers' greater traction, and thus, greater safety, when installing the roof, even in wet or otherwise slippery conditions.

The rubberized asphalt layer 12 generally comprises a material having from about 0-30% mineral stabilizer, (i.e., powdered limestone), about 5-15% styrene-butadiene copolymer or styrene-butadiene-styrene copolymer, and the balance being flux asphalt having a Ring and Ball softening point of between about 80°F and about 150°F, (i.e., between about 26.67°C and about 65.56°C). Additionally, a tackifying oil, such as Hydrolene may be added.

The supporting layer 18 is preferably a polyethylene film having a thickness of between about 2-7 mils and preferably about 6 mils. Coated upon the surface of the supporting layer 18 which is not in contact with the upper surface 14 of the asphalt layer 12 is the traction layer 20

which comprises a polyurethane material having a mineral grit 22 embedded therein. As noted previously, other materials such as epoxy, polyester, polypropylene, varnishes and the like may be substituted for the polyurethane. The grit provides the traction layer 20 with an exposed surface 30 having a roughness sufficient to effect a mechanical interference, and thereby gripping effect, with the sole of a boot or shoe being worn by a roofing installer. As such, the likelihood of an installer falling from the roof as a result of slipping on the membrane surface is significantly reduced.

The release layer 24 is typically a paper sheet having a siliconized surface 26. As an alternative, the release layer can comprise two separate sheets; a first supporting sheet of a paper or polymeric film, and a second sheet of a low surface energy material. Additionally, in the case of a siliconized paper, the silicon coating may be replaced by some other suitable low surface energy material such as a wax emulsion or a soap solution.

The finished weight of a roll of the material described above is typically about 25 pounds (about 11.4 kg). One roll is defined as 108 square feet of material (10.04 m^2). This amount of material typically is used to cover a approximately 100 square feet (9.29 m^2) of roof surface. The thickness of the finished membrane, less the release sheet, is between about 40 mils and about 60 mils. Rolls typically are about 36 inches (91.44 cm) wide and about 36 feet (10.97 m) long. It should be noted that although various dimensions are presented herein, they are intended as examples only and, as such, should not be considered to be limiting unless expressly set out in the appended claims.

FIGS. 3 and 4 show the manner in which the membrane material 10 is intended for use on a roof deck 36 in the region of the roof eaves 38. In applying the present invention, eaves flashing is replaced by the membrane 10 described herein. In use, the release sheet 24 is removed from the lower surface 16 of the asphalt layer 12, and the membrane 10 is secured to the roof deck 36 by adhesive action and/or nails. The membrane 10 is positioned along the leading edge of the roof. Subsequently, a first row of shingles 42 is positioned in an overlying relationship to the membrane 10. The shingles are secured in place using nails 40. Although the roofing installer will often be caused to stand on the membrane during installation of the shingles, the traction layer 20 of the inventive membrane 10 provides sufficient friction to minimize the likelihood of slipping. Thus, as compared to many of the known roofing membranes, the membranes of the present invention provide a safer work surface.

Equivalents

From the foregoing detailed description of the specific embodiments of the invention, it should be apparent that a unique roofing membrane material has been described. Although particular embodiments have been disclosed herein in detail, this has been done by way of example for purposes of illustration only, and is not intended to be limiting with respect to the scope of the appended claims which follow. In particular, it is contemplated by the inventor that various substitutions, alterations, and modifications may be made to the invention without departing from the spirit and scope of the invention as defined by the claims.

CLAIMS

1. A roofing membrane material which comprises:

   a) a rubberized asphalt layer having an upper and lower surface;

   b) a supporting layer disposed upon the upper surface of the rubberized asphalt layer; and

   c) a traction layer disposed upon the supporting layer.

2. The roofing membrane material of claim 1 wherein the supporting layer comprises a polyethylene film.

3. The roofing membrane material of claim 1 wherein the traction layer comprises a film having embedded grit particles.

4. The roofing membrane material of claim 3 wherein the film is selected from the group consisting of polyester, polypropylene and polyurethane.

5. The roofing membrane material of claim 1 wherein the rubberized asphalt layer comprises, in combination:

   a) a flux asphalt;

   b) a filler material;

   c) a styrene-butadiene-styrene copolymer; and

   d) a tackifying oil.

6. The roofing membrane material of claim 5 wherein the filler material comprises powdered limestone.

7. The roofing membrane material of claim 1 which further comprises a release layer adjacent to the lower surface of the rubberized asphalt layer.

8. The roofing membrane material of claim 7 wherein the release layer comprises a polyethylene film having a silicone coating thereon.

9. The roofing membrane material of claim 7 wherein the release layer comprises a paper having a silicone coating thereon.

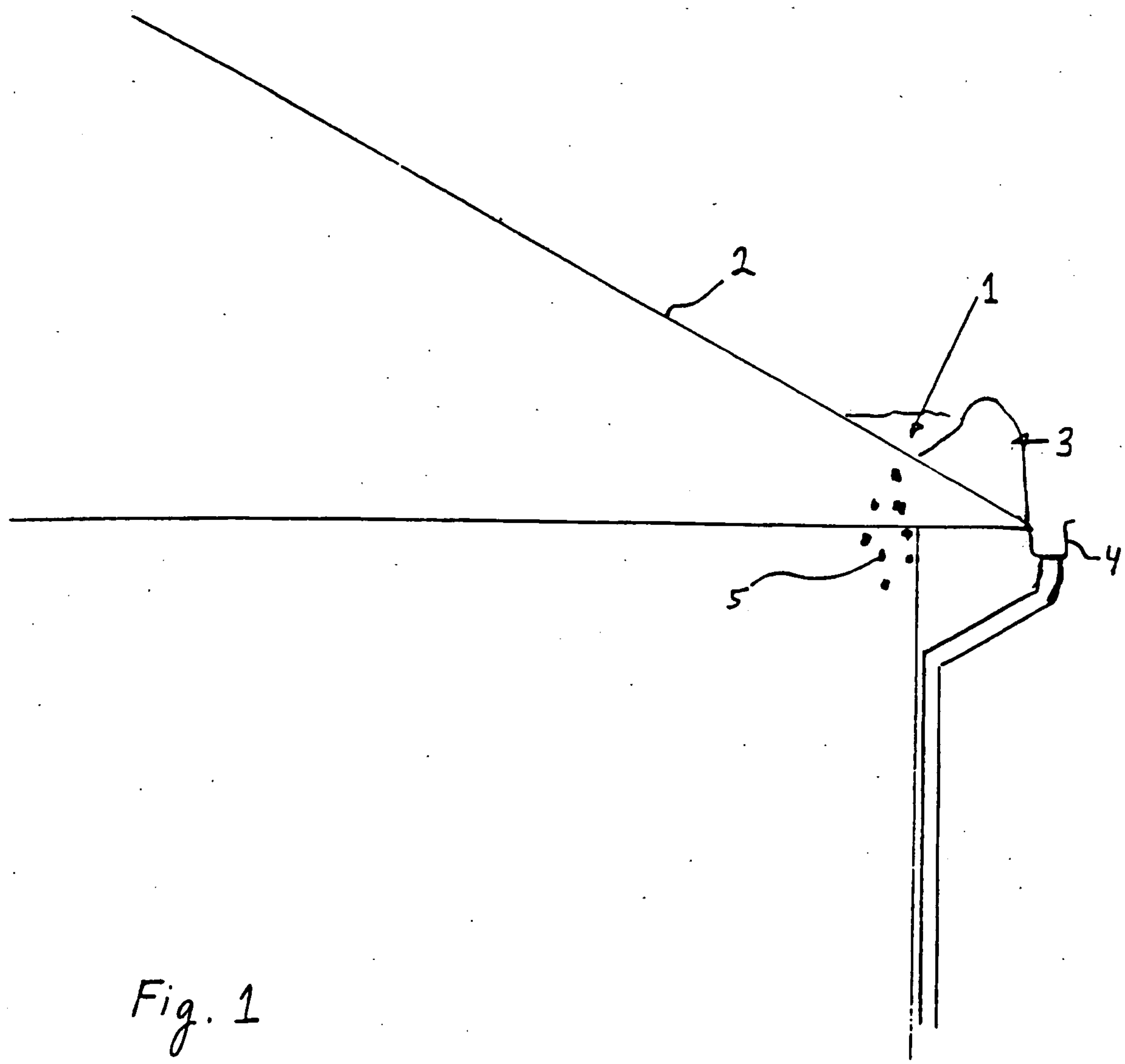


Fig. 1

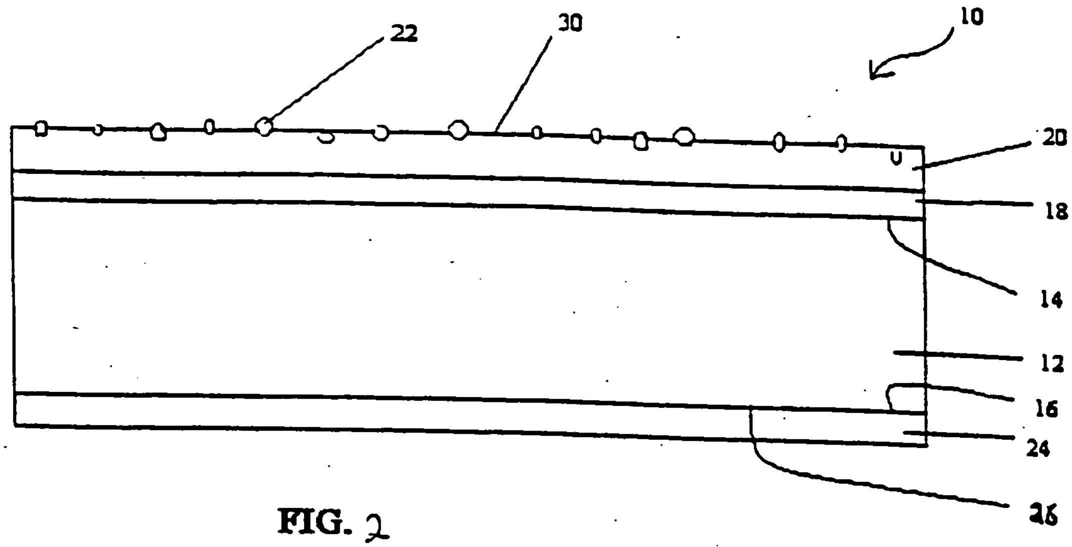


FIG. 2

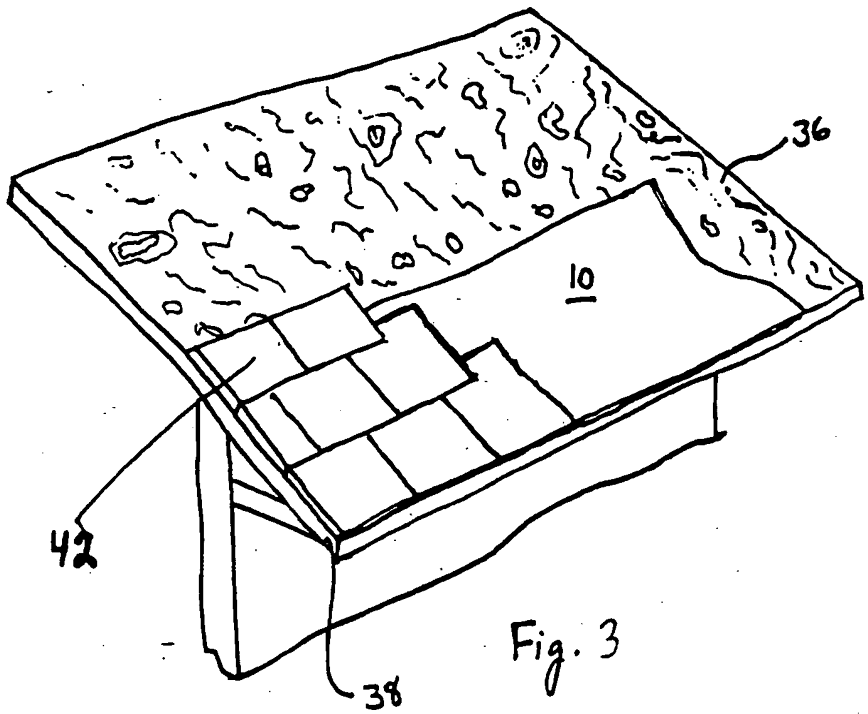


Fig. 3

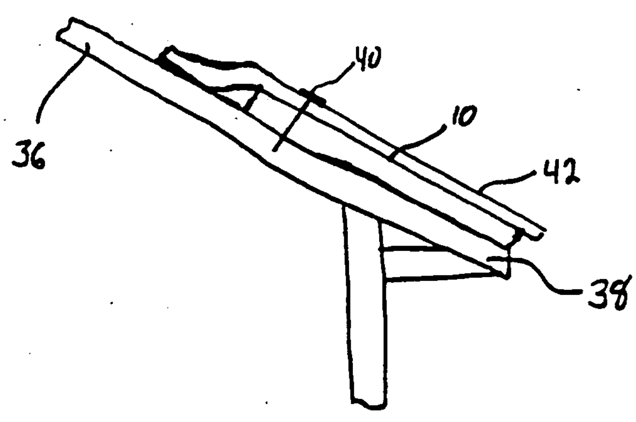


Fig. 4